GrummanWorld

Grumman Appoints 19 Division Officers

On Thursday, July 18, the Grumman board of directors appointed 19 people to new posts as division officers.

"This announcement coincides with the new Grumman Corporation organization chart issued last week," said Vice President – Secretary Bob Bradshaw. "We are continuing to flesh out the restructuring of the corporation, which was announced in February."

The following appointments were made:

In the Aerostructures Division, Don Schlegel has been named vice president and deputy director. He reports to Aerostructures President Tom McGrath.

The following people have been appointed in the Aircraft Systems Division:

Will Bischoff, senior vice president, Technical Operations.

James Bourne, vice president, Business Operations.

Jack Christiansen, vice president, Field Operations

Mike Ciminera, vice president, Advanced Systems.

These newly appointed division officers report to Aircraft Systems President Renso Caporali.

In addition, these appointments have been made in Aircraft Systems:

Bill Trillo, vice president, Calverton Operations, reports to Phil Vassallo, senior vice president, Product Operations.

Tom Doyle, OV-1 program vice president, reports to Pete Oram, senior vice president-Aircraft Programs.

Dick Kline, program vice president, Space Station, reports to Alex Alexandrovich, vice president, Space Systems.

In the Allied-Olson Division, Ronald Hale has been named vice president of Marketing. He reports to Sam Rozzi, president of Grumman Olson.

Two appointments were made in Data Systems: Tom Kelly, vice president of Information Resources Management; and Joe DiGiacomo, controller. Both report to John O'Brien, division president.

In Electronics Systems, John Keenan was appointed vice president of Technology; Ed Stroud, vice president of Test Equipment Products; and Gary Symansky, controller. All three report to Bob Nafis, division president.

In the St. Augustine division, Marty Dandridge was named vice president, Programs and Business; Frank Leone, vice president, Operations; and Frank Rizzo, controller. They report to Joe Walter, St. Augustine Division president.

Wiley Williams has been appointed vice president of Shuttle Processing Contract for Technical Services. He reports to Fred Haise, division president.

In the Services Division, Jake Bussolini was named vice president of Business Operations. He reports to Bob Myers, Grumman Corporation senior vice president. ▪

New Bonding Technique Helps Pearson Build Stronger Yacht

Pearson Yachts is changing production techniques – from the inside out.

A new vacuum bonded system for attaching fiberglass interiors to the hulls of boats has recently been instituted on both the P-28 and P-36 lines.

The new system involves bonding a complete fiberglass interior unit – an absolute match from bow to stern – to the hull of the boat. Previously, only pieces of the fiberglass interior unit were installed and had to be hand tabbed into place.

"The total interior of the boat is now finished as smoothly as the exterior," says Pearson's director of Manufacturing, William Lawton. "It creates a single unit which is much stronger than with the previous tabbing method."

Once the interior is lowered into the hull, a vacuum hose is attached to remove all the air space between the two structures. The effect is a double reinforcing of the hull.

According to Marketing director Ched Gladding, the success of this new process on the P-28 and P-36 models has influenced Pearson's decision to continue its use when production of a new 33-foot model begins in the fall. ■

About the Cover

No, it's not a scuba diving lesson. This photograph was taken at NASA's Marshall Space Flight Center in Huntsville, Alabama, and the divers are astronauts. Grumman will conduct such experiments as part of a recently-won contract to study Space Station servicing. The water tank simulates the neutral buoyancy of space. More on page 3.

Last Call: Picnic Tix

Start packing tonight for tomorrow's Grumman Family Picnic at Calverton. The gates open at 8 a.m. and the picnic officially begins with the traditional flag raising at 10 a.m.

If you haven't purchased your tickets yet, you must buy them today – *no tickets will be sold at the gate*. They're available at your local Employee Services (ES) office for $5 per person. Kids under 12 are admitted free.

For first-time picnickers, here are the directions to the Calverton picnic grounds: take the Long Island Expressway to Exit 69, Wading River Road. Head north to Route 25, turn right, and follow the signs. Or, take the LIE to Exit 68, William Floyd Parkway, go north to Route 25, turn right, and follow the signs.

X-29 Gets Ready To Break Sound Barrier

The Mojave Desert waits once more for the sonic boom of an "X" plane breaking the sound barrier. The latest X-plane – the Grumman X-29 – is scheduled to break the barrier in September at Edwards Air Force Base, California. The technology demonstrator is now being prepared for its first supersonic flight.

"Flight control system modifications are being put in now," says Glenn Spacht, X-29 deputy program manager. "The modifications are for the back-up flight control system and they will ready the aircraft for the full flight envelope."

Spacht explains that the X-29 "will go supersonic in its next series of flights, and we'll also be looking at its performance at transonic maneuvering speeds." These scheduled Extended Envelope Modifications, as they are called, are just about completed and the X-29 should again take to the air early next month.

A team of 50 Grumman technical personnel – 15 more than the regular contingent that supports the ongoing NASA X-29 test flight program – is making these scheduled changes at Edwards.

With the X-29's original fly-by-wire system, a major failure in all three digital computers would switch flight control to the back-up analog computers. But the analog computers were not initially set up to control the aircraft above speeds of 350 knots.

The X-29 has already reached that speed and pushed other limits of its envelope after 16 nearly flawless flights amounting to 20 flight hours. The forward swept wing technology demonstrator has climbed to 30,000 feet, reached a 20-degree angle of attack and generated forces on itself that were 5.3 times the pull of gravity.

Soon, only the sky will be the limit for Grumman's forward swept wing technology demonstrator. Scheduled modifications now being made to the X-29 will allow it to break the barrier first broken by the X-1: the sound barrier.

"Its operation has been almost unbelievable," Spacht states. "On several occasions it has flown two flights a day, which is unheard of for an aircraft as radical and as immature as it is."

While X-29 No. 1 is about to make aviation history, Grumman is hoping that its sister aircraft, which is still under wraps at Calverton, will also make a mark in the record books.

"Grumman has submitted a proposal to the Air Force to take No. 2 and finish the installation of the flight test instrumentation system and install a spin chute," says Spacht. The spin chute will be required to protect the pilot and the plane during high angle of attack testing. In such tests, the plane's nose is pointing higher than the direction of travel of the aircraft.

During these tests the wings are stalled and it is possible, though unlikely, for the aircraft to depart controlled flight and go into a spin. The spin chute will pull the tail up, pointing the nose down and allowing air to flow over the wings again. When there is enough lift for the pilot to regain control, he releases the chute.

"If the Air Force elects to undertake this project, once the work is completed we'll send the aircraft to California." Spacht says that it would take about 15 months to get X-29 No. 2 ready for takeoff at Edwards. ■

Big Bang Barely Scratches Composite Nuclear Shelter Wall

A specially designed graphite epoxy composite wall, manufactured at Grumman's Milledgeville, Georgia facility, underwent a trial by fire recently. With a brilliant flash and a teeth rattling bang that sent a mushroom cloud several miles into the desert air, the U.S. Defense Nuclear Agency (DNA) set off the largest non-nuclear explosion ever detonated in the free world.

The unusual demonstration took place at the U.S. government's military test site in White Sands, New Mexico on Thursday, June 27. Sitting not far away from ground zero was Grumman's nuclear hardened International Standardization Organization (ISO) shelter wall. The prototype wall was built by Milledgeville Operations under a subcontract to Kaman/AviDyne, a division of Kaman Sciences Corporation, Burlington, Massachusetts.

The wall was designed to be part of an 8-by-8-by-20 foot trailer-like container to house critical electronic equipment in the field. The container must be able to withstand normal service wear as well as the enormous pressure, and radiant heating, that would occur if a small tactical nuclear weapon were detonated nearby.

"The DNA is looking for a way of protecting highly sensitive and expensive electronic equipment from the effects of a small scale tactical nuclear strike in the field. The survival of this kind of equipment after a nuclear explosion would be essential to an army's ability to continue functioning in the field after such an attack," says John Roman, project manager, Advanced Development – Advanced Composites Group.

For the test, the composite panel was mounted on a standard metal construction trailer. The trailer was positioned so that the composite side panel was facing the airblast.

The furnace-like temperatures of a nuclear blast were simulated by having a series of heat jets flash directly onto the wall only seconds before the explosion.

The explosion, which was created by a mixture of ammonium nitrate and fuel oil, was designed to simulate a nuclear blast. Its effects were equivalent to detonating an eight kiloton nuclear device. By comparison, the bomb that destroyed Hiroshima in 1945 had a yield of 13 kilotons.

Four hours after the blast, when the dust settled and smoke cleared, DNA officials deemed the area safe. Inspection of the panel showed virtually no visible damage. In fact, during inspection of the various experiments that were conducted in conjunction with the blast, the doors of the ISO shelter could still swing open, as if nothing more than a thunderstorm had passed by. Doors and moving parts on several other tests were either jammed or the structure itself wrecked by the blast.

"The explosion was really incredible to witness," says Roman. "All the spectators were seated in open stands five miles away from the blast. We saw the flash and the mushroom cloud before we heard the explosion. Then we watched as visible shock waves rumbled across the desert at us.

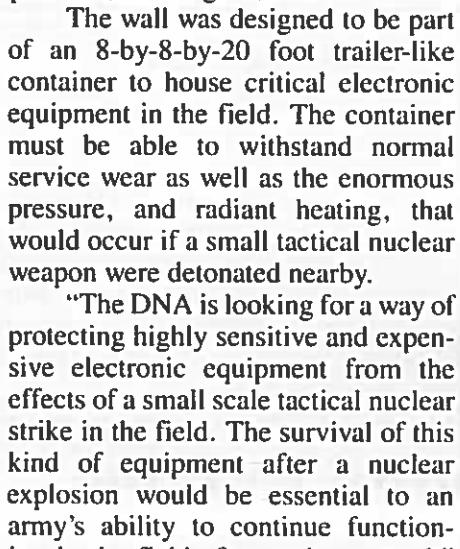
"But even more impressive was that the composite wall performed so successfully," he says. "Coming away from a blast like that with hardly a scratch brought up Grumman's old 'Iron Works' nickname among the officials and technicians out there."

The nuclear hardened trailer will be constructed according to the ISO requirements for an equipment shelter that can be used throughout the world. "The design that we are working on with Kaman/AviDyne is stackable and interlocking for container ship transportation," notes Roman.

As a result of the successful blast test, the team of Grumman and Kaman/Avidyne has been awarded a study contract to develop construction blueprints for a complete advanced composite ISO shelter. "We beat out some pretty big competitors to get to this phase of the program, including Budd and Boeing Aerospace," says Roman.

DNA is considering an initial production contract for approximately 500 units or more, according to Roman. The prototype production contract for the shelter will go out for open bids in the later part of 1986.

"We are concentrating our design efforts on a graphite epoxy construction that can be made by Plant 66," says Roman. "Right now we are encouraged by the way the composite panel stood up to the blast test. It really puts Grumman in a good position for a future production contract." ■



On Thursday, June 27, the U.S. Defense Nuclear Agency set off the largest non-nuclear explosion ever in the free world, creating a mushroom cloud similar to the one pictured above. At the Trinity test site in White Sands, New Mexico, a Grumman-made composite nuclear hardened shelter wall was tested not far from ground zero.

Visitor Clearance

Changes have been made in the visitor control procedure for some Bethpage plants.

Visitors for Plants 12, 15, 30, 35, 39, Grumman Headquarters, and Grumman Data Systems (the old part of headquarters) will be processed within those building's lobbies. Those visiting all other Bethpage plants must be processed at Plant 18, until further notice.

For further information, call Guard Headquarters, Plant 18, Ext. (111) 53895. ■

At the new GDS Production Center in Holtsville (L.I.), Noreen Schlener returns a production job file to the tape library.

All Systems Go At New GDS Production Center

The Data Systems division has completed the transfer of its customer business operations to the new Holtsville Production Center on Long Island.

The new center officially began operation after the Memorial Day weekend with the transfer of some 300 operations and systems support people from Bethpage. It is located on the north service road, off Exit 62 of the Long Island Expressway.

The move was completed without any disruption of service to the customers, which are Grumman divisions and outside businesses.

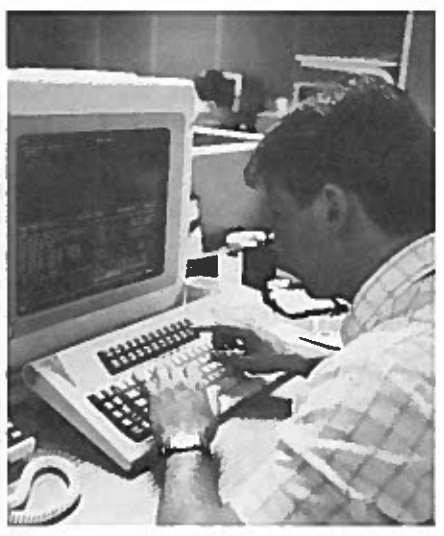
Containing a total floor space of 175,000 square feet, the building was planned to accommodate up to five years of growth. Additionally, the complex is located on 44 acres, which leaves plenty of room for expansion.

From a network of 3,000 customer terminals, the Center handles about one million on-line transactions daily. In addition, it also handles batch work such as work orders, purchase orders and other standardized forms.

"Although technology is constantly reducing the space necessary for computer power, we are using more computing than ever to stay competitive," says John Bohlander, senior vice president. "Simply stated, we were running out of room in our current facilities. Our only realistic option was to build a new facility to accommodate current and future growth."

Planning for the new center began in early 1983. Groundbreaking took place in January of 1984.

Remaining work on the exterior, front lobby, parking lots and landscaping are to be completed by late summer. ■



The Holtsville Production Center services work from over 3,000 customer terminals, similar to those awaiting installation (top). Bonnie Jamison (L) selects a tape for a batch production job. Nick Fitterman (R) troubleshoots a job in the customer assistance department.

Astronauts Becoming Aquanauts For Space Station Study

Imagine trying to repair your swimming pool filter, underwater, wearing a deep sea diver's outfit. Your movements are slowed, your dexterity is practically nil, and all the little plastic parts repeatedly float out of your grasp. This amusing scenario gives you a rough idea of just one of the problems to be faced by crews who will service the Manned Space Station when it goes into orbit during the 1990s.

Underwater acrobatics somewhat akin to the above will be enacted by astronauts as part of a study contract Grumman recently won from Marshall Space Flight Center in Alabama. Grumman's 30-month study will define and develop in-orbit servicing techniques and equipment for the Space Station and its associated space platforms.

At present, just what in-orbit servicing will entail is largely conjecture, since the Station itself is in an early stage of development. One thing is sure: complex pieces of machinery tend to require complex service and maintenance, and the Space Station will certainly be no exception.

'NASA will want to make servicing the Space Station less human-intensive.'

"The basic objective of the study is to identify the procedures and tools required for servicing," says Roy Olsen, project manager for the study. Grumman's subcontractors are TRW Corporation, the Massachusetts Institute of Technology, and Essex Corporation of Huntsville.

Grumman's final product will be a blueprint from which a Space Station servicing and maintenance regimen can later be put together. "We will spell some of the details out in the study," Olsen notes. "But the requirements could change. Current Space Station concepts, for instance, are not cast in concrete. So, the details of servicing and maintenance can be expected to evolve and grow as the Space Station evolves and grows."

The study will have four phases: an initial idea phase; earth-gravity, or one-G, simulations in mockups that will be delivered to Marshall during the study; simulations in a huge water tank at Marshall, which will mimic the buoyancy conditions of space; and a flight experiment concept definition phase.

The study will complement systems definition work Grumman is now doing on the Space Station. The work has been divided by NASA into four packages, and Grumman is on industry teams working on three of those four. Grumman is also teamed with TRW on the Orbital Maneuvering Vehicle, a program now in its development stage that is separate from the Space Station effort.

"Our involvement in those work packages and with the OMV will help us select tasks for simulation in this program," says Olsen. "We have a broad perspective . . . My hope for this particular program is that it will lead to a contract for a Shuttle flight experiment — perhaps even multiple experiments."

The study will examine three types of human and machine activity. Each is expected to play some part in Space Station servicing – some more, some less.

Extravehicular activity, or EVA, is space program lingo for travel outside the spacecraft, whether using some sort of hose-like life support system or propelled by a device akin to the present Manned Mobility Unit.

For this part of the study, Olsen's team will be able to compare notes with Grummanites working on the Advanced EVA System Design Requirements Study. This $700,000, one-year contract with Johnson Space Center calls for a "straw-man specification" for a Space Station EVA system – the first stab at designing actual hardware. Some of the elements being researched for the EVA Study include a new flexible-metal spacesuit, manipulator foot restraint, power pack, tool kits, portable computer, and a portable workstation.

A second category, intravehicular activity (IVA), includes all the goings-on inside the Station – including the support activities for people, machines, or both, on the outside.

Last but certainly not least, the study will examine robotics. The study aims to identify the most productive combination of each of the three elements. Robotics, however, is expected to play a major role.

"NASA will want to make servicing the Space Station less human-intensive," Olsen points out. "Remember, the crews will be up in orbit for long periods, and they'll have a lot to do. NASA will want to minimize the time they spend on servicing, the training involved, and the costs."

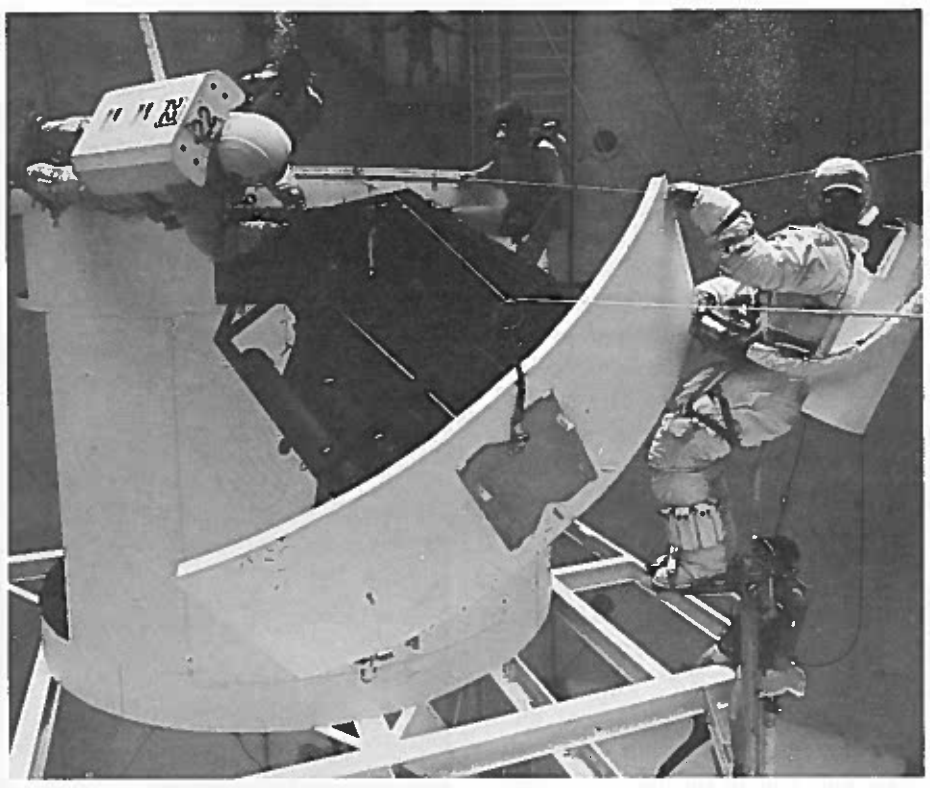
Two ultrasophisticated concepts under investigation are telepresence and telerobotics. Simply put, telepresence involves sensory techniques that would enable an astronaut to make repairs without venturing outside the Station. Television cameras, touch sensors, and other devices would continually gather massive amounts of data on the part to be repaired, and beam data back to a workstation inside. This data would be presented to the astronaut with a high level of realism.

'Current Space Station concepts are not cast in concrete.'

Theoretically, the system would give the astronaut almost a sense of "being there." This would enable him or her first to accurately assess what should be done, then make a repair with some sort of dexterous manipulator arm.

Telerobotics essentially incorporates the capabilities of intelligent robots and telepresence concepts. Such a robot would be programmed to do a particular service or maintenance task on the exterior; the astronaut would act as a "supervisor" from inside.

One of the most interesting parts of the study will take place in midsummer 1986, when simulations will be conducted in a 50-foot-high water tank at Marshall. It is large enough in circumference to hold the entire Space Shuttle cargo bay.



Simulating neutral buoyancy will be an important part of Grumman's study contract. A 50-foot-high water tank is used for such tests, simulating the neutral buoyancy of space. The above experiment involved a space telescope.

Water is used to simulate the neutral buoyancy of the close-to-zero-gravity space environment, hence the tank's name — the Neutral Buoyancy Simulator. Buoyancy refers to the ability of an object to float or rise, and on land, the human body has virtually no buoyancy. In water, however, humans have more buoyancy, though a fraction of that in zero gravity.

Quite a large crew gets involved in a neutral buoyancy exercise, including divers, safety divers, and scuba camera people as well as astronauts and stand-ins. "So you'll get fifteen to twenty people swimming around in that tank for a major test," says Olsen.

The water tests have their limits — in a true zero-gravity environment, the human body is weightless and therefore has complete buoyancy. But the simulator is the closest to the actuality of zero-gravity that can be done while at the same time permitting long-duration practice exercises.

One simulation that will definitely be performed in the tank – this was spelled out in Grumman's proposal for the study contract – will be the replacement of a radiator panel on a Space Station mockup. ■

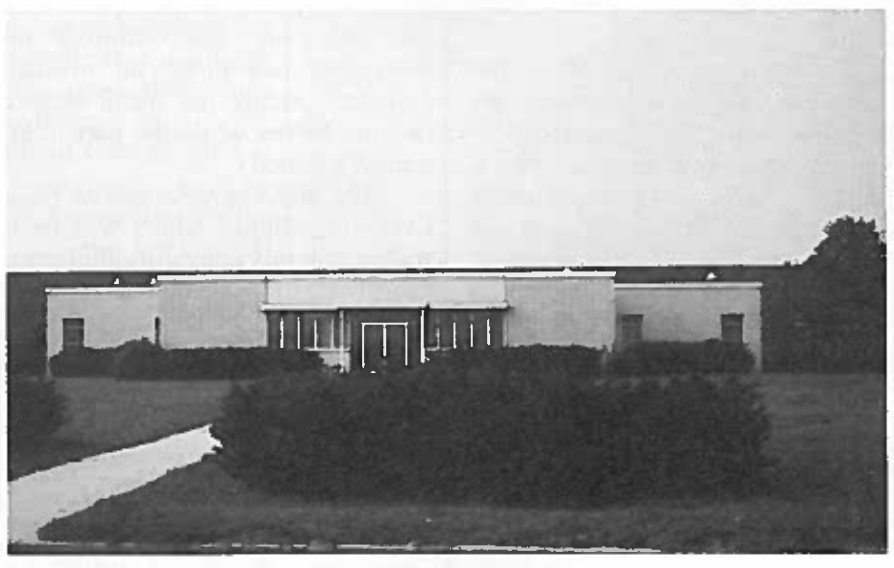
Electronic Systems Opening New Maryland Plant

The Grumman Electronic Systems Division will open a new facility in Salisbury, Maryland, to manufacture cables for military and commercial aircraft later this year.

The company is purchasing a 106,000 square foot building located on the former site of Salisbury Manufacturing Company.

Hiring will begin in September for a fourth quarter startup. By the second quarter of 1986, there will be 300 employees, including some 30 transferred from other Grumman locations.

The company and the State of Maryland will cooperate in recruiting and training employees from the Salisbury area. Salisbury is located on Maryland's Eastern Shore on the Delmarva Peninsula. ■



Some 300 Grummanites will eventually be producing electronic harnesses for military and commercial aircraft in Electronic Systems' newly purchased Salisbury, Maryland facility.

Bend And Stretch: Old Craft Gets New Twist

Computerized Stretch Presses Offer Easier Setup, Repeatability

Rich Langdon dons safety glasses and white gloves to operate the computer numerical controlled Cyril Bath stretch press. As he presses the buttons on the machine's two keyboards, he watches a television monitor mounted above the work area.

"LOAD," reads the monitor, beginning a series of step-by-step instructions in the making of a specific part. The press has two swinging arms, which open fully to allow Langdon to load a straight piece of aluminum.

After Langdon presses the appropriate buttons, the two arms swing and there's the brief "clunk" of metal against metal. The strip of aluminum now has a new twist.

Bending aluminum and other metals into aircraft detail parts is a tricky job. But in the last few years, this crucial manufacturing step has been made easier, thanks to the debut of computer numerical control (CNC) equipment like the 21-ton press Langdon uses.

The stretch press area is one of the many manufacturing facilities now being revamped as part of Grumman's $300 million modernization program. Aircraft Systems' Plant 3 in Bethpage has undergone the most dramatic transformation thus far. Shop areas that had become shopworn over the years have acquired new equipment and a splash of bright new paint. Sooner or later, the modernization plan will affect all Grumman manufacturing plants in some way.

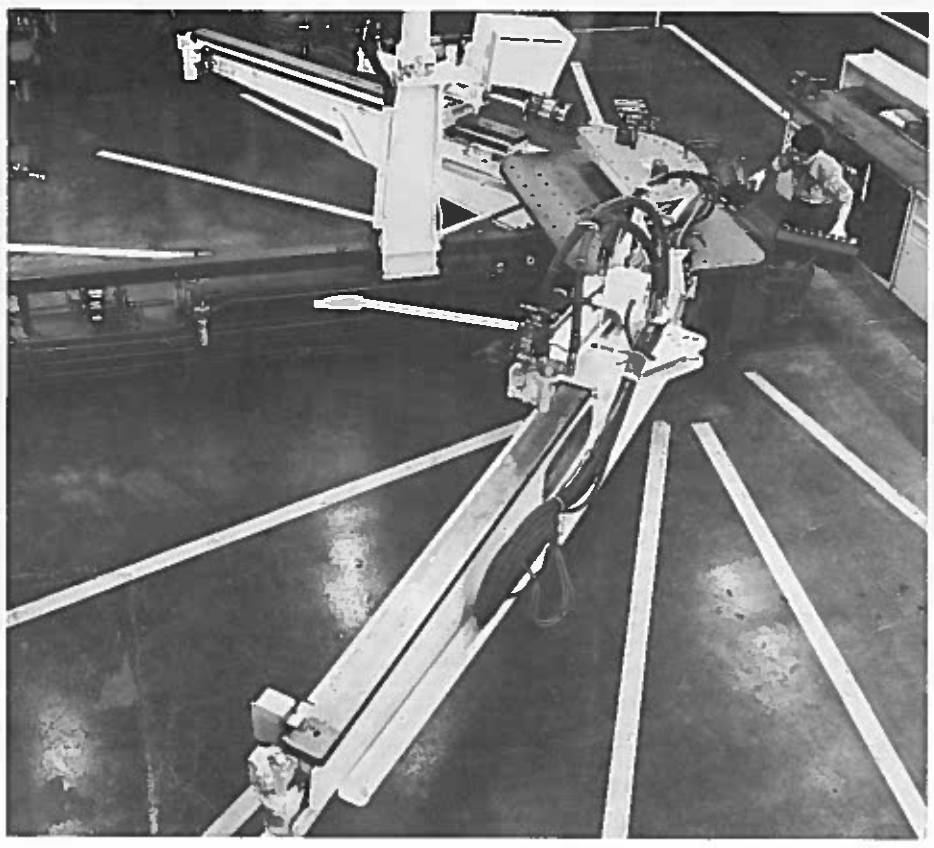
During the morning coffee break, Langdon's corner of Plant 3 is relatively quiet, save for some rivetting down the hall. For Langdon, a Press Department keyworker, the shiny, three-year-old CNC stretch press is quite an improvement over the World War II-vintage equipment it replaced.

'You feel better about what you are doing.'

"The job is a lot simpler, and it's definitely quicker . . . plus, it's a better work atmosphere. You feel better about what you're doing," says Langdon, who had worked on stretch presses for several years when the new machines came in.

One of the greatest payoffs of the new equipment is a more consistently high quality, which in turn means less scrapping and lower material costs. Using the old presses, operators had to set and reset the machines for each and every part on their order list. Being able to set all the right stops and produce a perfect part on the first pass was a skill acquired only after years on the job.

"Often, there was one individual who was here for 30 years and he was the only one who could make a particular part or operate a particular machine," says Bill McKenna, an industrial engineer for the modernization program. "When he retired or was out sick, we lost that skill."



Rich Langdon, operator of the 21-ton Cyril Bath stretch press, has a positive view of plant modernization. "It's a better work atmosphere," says Langdon. "You feel better about what you're doing." Computer numerical control means all the specifications for making a part are on a tape, making the job easier and quicker.

Each computer numerical control (CNC) machine has an integral computer, as well as a video terminal. "We used to keep all the machine settings on operations sheets or on five-by-eight cards," says Langdon. "Now, the information is all on tape. The TV screen displays all the necessary setup instructions – such as the types of jaws or lubricants to use."

The three units Langdon works on – the 21-ton, 30-ton, and 75-ton swing-arm presses – have been in place for about three years now. A recent arrival is a 400-ton sheet-stretching press with a 150-ton overhead, or "bulldozer," ram. This machine is so huge that a multi-story excavation, 35 feet at its deepest point, had to be dug in the floor of Plant 3 to accommodate it.

The swing-arm units perform a function known as stretch-wrapping – sheet metal is literally stretched and wrapped. They are used primarily to stretch form extruded shapes of sheet-metal sections. The 400-ton unit is a combination stretch and stretch-draw unit. It is used to stretch form flat sheet metal over a male form, or stretch draw form irregularly shaped parts using matched tools. The bulldozer ram moves up and down on hydraulic cylinders, sizing the metal between two die halves while the part is in a state of plasticity.

The 400-ton press and its larger, 1,000-ton sibling, which will be installed later this year, will significantly contribute to phasing out the drop-hammer process. This is a forming process used to make many oddly shaped detail parts. Making a part with a drop hammer sometimes takes as long as an hour and half, and now will only take half an hour or less by stretch-draw forming.

The new machines offer more settings than their mechanical predecessors. "Not only does that make it easier to make existing aircraft parts," says Joe Newman, section head, Process Engineering Metallics. "You can make parts that weren't possible before."

Newman notes that the stretch press is somewhat generic to the aerospace industry, where thousands of different parts must be produced in rather low quantities. Hence, the equipment must be highly versatile. Computer numerical control is the state of the art, and, eventually, all of the units will be linked to a centralized computer to share parts data.

One job that will be accomplished on the 1,000-ton stretch press is the 22-foot long extrusion for the Boeing 757/767 subcontract program. Now, two separate procedures, one in Plant 2 and one in Plant 3, are required. The 1,000-ton press will do it all. From the new equipment, the press area realizes an average time savings of about 30 percent.

Jim Hill, leadworker in the Press Department, describes training for the new machinery as pretty straightforward. "Once you learn it, it's simple to operate," says Hill, as he runs the 400-ton press. "It's like anything that's new – you have to get accustomed to it."

'Once you learn it, it's simple to operate.'

It is also easier for a novice to become proficient on the new equipment. Some might argue that automation steals a craftsman's skills. Langdon feels the opposite is true: that the computerized equipment requires more skills, not fewer. One of the old machines, a Maust stretch press, will continue in use; it was rebuilt recently to its original specifications.

"The use of computers means a person learns a whole new set of skills," says Langdon.

Newman says significantly higher quality parts will be produced. "There will even be less distortion in heat treatment done after stretch draw forming. Drop hammered parts often came back distorted, which means additional power hammering – another waning art."

All told, the three swing arm stretch presses and two presses represent an investment of $5 million – not counting installation costs. McKenna estimates the payback period to be five years. In addition to time and labor savings, the new equipment saves on maintenance and downtime.

"Every new thing has it's problems, but it works out," notes Tyson Dominy, a project manufacturing engineer for the CNC Swing Arm Stretch Presses. "You've got to be patient. We've had our growing pains, no doubt about it. But things are running smooth now."

Adds Langdon: "I always like a challenge. You give anything a chance and it'll work."■

Obituaries

George Boehle, EF-111 Instrumentation Test, Plant 6, died June 19 at the age of 56. He had been with the company since 1952 and resided at Woodcliff Dr., Box 1022, Mattituck, N.Y.

John Graham Courtney, Electronics, Plant 14, died June 26 at the age of 48. He had been with the company since 1965 and resided at 339 Waterside Rd., Northport, N.Y.

Richard A. Holmes, Project Management, Plant 1, died June 27 at the age of 55. He had been with the company since 1963 and resided at 111 Fairview Ave., Deer Park, N.Y.

George J. Buckley, Production Control-Parts Control, Plant 2, died July 2 at the age of 65. He had been with the company since 1964 and resided at 60 Lion La., Westbury, N.Y.

Eleanor M. Dehner, Central Shipping Management, Plant 17, died July 2 at the age of 55. She had been with the company since 1969 and resided at 3853 Green Pl., Bethpage, N.Y.

Frederick W. Schoppmann, Plant Protection, Plant 18, died July 8 at the age of 58. He had been with the company since 1981 and resided at 614 Nassau Blvd., W. Hempstead, N.Y.

Frank Mistretta, F-14 Module Buildup, Plant 6, died June 27 at the age of 58. He had been with the company since 1966 and resided at 19 Stuyvesant La., Smithtown, N.Y.

Clarice Kirby, Assemblies, Plant 3, died July 8 at the age of 38. He had been with the company since 1976 and resided at 102 E. Greenwich Ave., Roosevelt, N.Y.

Christopher Allen, Electric Bench Assembly, Plant 6, died July 2 at the age of 23. He had been with the company since 1984 and resided at 279 West End Ave., Shirley, N.Y.

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'We Change Programs Like You Change Your Socks'

Stuart Grummanites Take On An Ever-Changing Variety Of Manufacturing Jobs

The air is usually warm and humid, local accents bear a trace of a drawl, and the lifestyle is easygoing.

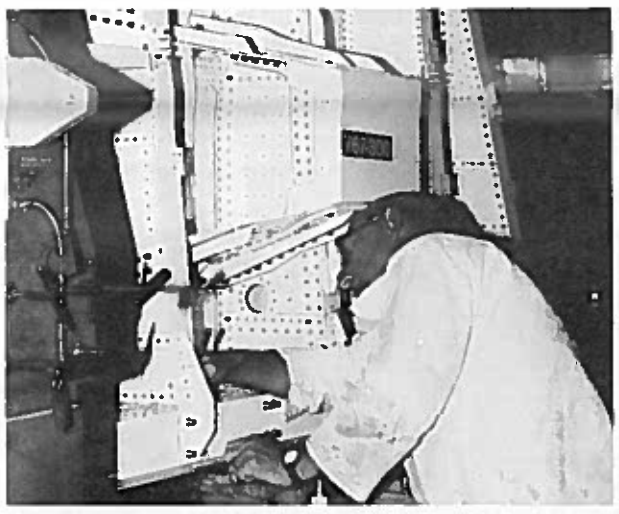
Inside, by contrast, the work pace is brisk, almost frenetic. The jackhammer noise of rivetting is constant, and visitors quickly learn how to use the earplugs donned routinely by the folks who work there.

The place: Grumman's Stuart Operations Center, in a small town about 45 minutes north of West Palm Beach, Florida.

Stuart has long been known as "Mohawk Country" for the unusual looking OV-1D surveillance plane, which Grumman converts there for the Army. And it produces subassemblies for all of Grumman's Navy aircraft programs. But Stuart is also where Grumman does most of its manufacturing of commercial aircraft subassemblies. (Commercial work involving composites is handled at Grumman's facility in Milledgeville, Georgia.)

Since Stuart began handling subcontract work in the Seventies, it has produced structures for a variety of aircraft companies worldwide. These include two recently completed jobs: the Cammacorp re-engining program for the McDonnell Douglas DC-8 and the Sikorsky CH-53 helicopter aft section.

Stuart currently builds engine nacelles with thrust reversers for British Aerospace, Dassault, Falcon, and Israeli Aircraft Industry. Engine nacelles are cylindrical structures that help muffle the noise of an aircraft engine. Thrust reversers, as the name denotes, reverse an aircraft's forward movement during landing.



In Stuart's commercial programs building, Pete Proctor paints a subassembly area of the Boeing 767 wing center section.

date has been the production of the wing center section for the Boeing 767 aircraft, which has been touted as one of the most fuel efficient.

The fast-changing nature of this business, and the fact that orders sometimes come in comparatively small quantities, might be an insurmountable challenge for some companies. At Stuart, however, Grumman has turned a potential liability into an asset. It has built a stable, experienced work force that can readily adapt to new programs with just a small dash of training.

Stuart's Vice President and General Manager, Bob Watkins, never lets an opportunity go by to sing the praises of his crew. "Visit the shop and you'll find the tempo on the shop floor is excellent," says Watkins, who took over the operation when Vice President Ed Dalva retired last year. "There's a lot of noise, a lot of effort, a lot of activity. The work ethic is alive and well in Stuart, Florida."

As an example of the crew's dedication, Watkins cites the Boeing 767 subcontract program. Grumman recently received Boeing's Operation Eagle award for its contribution to cost savings and productivity on this program and the Boeing 757, which is handled by Milledgeville.

"Boeing did not get to be big, rich, and famous without wise business decisions," says Watkins. "Boeing's future rests largely on the 767. We build the center section here, put it in a railroad car, and ship it across the U.S. to Seattle. Look around. There's no one from Boeing here . . . not one single inspector, auditor, or anyone else. That's a real testimony to the quality of what we do."

The Boeing 767 program is a big undertaking in

Larry Pacelli works on the Boeing 767 wing center section. Upon completion, the structures are shipped by rail to Seattle.

both quantity – the contract calls for a total of 300 shipsets – and sheer size. A 767 wing center section measures 27 feet long, 16 feet wide, eight feet high, and weighs 6,500 pounds. And since most of the drilling and rivetting is on the underside, the structures are built in rotating fixtures, preventing a lot of strained necks. The work is done upside down until the underside is complete; the fixture is then rotated right-side-up.

Managers, foremen, and other business people pay close attention to learning curves. When applying skills to a new job, the first attempt will take the longest; for each item produced, that time is reduced. The steepness of the learning curve hinges on the expertise of workers.

Watkins makes a sharp downward slope in the air with his hand to illustrate this point, noting that Stuart has "excellent learning curves."

"The people at Stuart are quite used to the fact that we change programs here like you change your socks," he says. "There's always old business going out, new work coming in. It's just the nature of the business. The people here have gained enough seniority and experience that they can learn a new program fairly rapidly.

"And how fast a group of people come down that learning curve determines how fast you make a profit," he adds.

A new commercial program often begins in a rather curious fashion for this crew of quick learners. A nucleus of Stuart personnel has recently moved north for several weeks to Bohemia, Long Island, to Grumman's Commercial Development Center (CDC).

"The Stuart people go up to Long Island to learn the program, not be trained," says Watkins. "That's an important distinction. They apply the same generic skills to each new program."

At Bohemia, the crew begins turning out nacelles, thrust reversers, or whatever a particular contract might encompass. The crew also builds some of the tools that the job will use.

Right now, the team of Stuart Grummanites is in Bohemia beginning work on a contract to manufacture thrust reversers and engine nacelles for the Gulfstream IV executive jet and the Fokker 100 passenger plane. Flight test articles are to be produced there and will be delivered to both customers later this year.

At the Commercial Development Center, a person from this nucleus group is assigned responsibility for each part of a job. The G-IV/Fokker group includes experts on the inlet ducts, nacelles, tailpipes, thrust reversers, engine mount, and shear panel.

In four months – tops – a nucleus group will have its work flows mapped out, all the right tooling, and glitches debugged. They even have a floor plan for their operation, and when the right time comes, the job gets moved lock, stock, and barrel down to Stuart.

So not to disturb the production line, moves are made gradually, one cell at a time. To oversimplify, a cell is a cluster of people performing closely related manufacturing functions. Fixtures, machinery, tool cribs, and material are loaded onto trucks for a nonstop, 24-hour trip south.

Upon arrival at Stuart's Commercial Programs building, cells are regrouped the way they were at Bohemia. When interrupting production is unavoidable, the crew will work overtime during the weeks prior to the move in order to get sufficiently ahead of the schedule.

Navy subassembly programs move south in similar fashion. This may seem pretty complicated to the casual observer, but Stuart folks say it's a matter of course. "Nothing is a first-time experience here," says Joe Morgan, manager of Commercial Production at Stuart. "We've become well acquainted with a variety of programs and customers.

"We're very versatile here," says Bill Mang, production chief. "We work on parts of almost every Grumman product. We've even built truck bodies and hydrofoil boats. So when it comes to new programs, we've been there before. Practically every program here has come from up north. One of the most important elements is careful planning."

Once the G-IV/Fokker work arrives at Stuart, it will take up the slack created by the completion of the Cammacorp and Sikorsky programs in early June. "In the meantime, we do everything in our power to keep our work force busy," says Watkins. "Even if it means getting an avionics technician to work in the wire room temporarily. We don't want to lose these people's skills."

"The G-IV/Fokker contract will represent years of work," says Morgan. "We will produce approximately 172 shipsets, and there's some possibility of a follow-on. We don't know yet what the manufacturing rate will be."

This diversity of projects makes for high job satisfaction at Stuart. "People here welcome new jobs," says Dan Strauss, its quality control manager. "This cuts down on boredom, and sharpens people's skills.

"This facility has made some leaps and bounds in the last 10 years," he continues. "It used to be that when major programs came in, people wouldn't think of Stuart. Now we've become a major asset to the company." ■

Subassemblies for Navy aircraft are produced at Stuart, too. Here, Larry Miller and Mike Armenia install fasteners on an E-2/C-2 stabilizer fin.

Beating The Heat: Dog Days Ma

Leroy Madison Jr. is maneuvering a heavy steel plate onto an oven dolly. As he leans over to adjust the plate, a drop of sweat follows a familiar path down his forehead, rolling off the end of his nose onto the shop floor. It is only 10 o'clock in the morning but already Madison is literally soaked in perspiration.

Outside it is 90 degrees and climbing with the humidity at a saturating 80 percent. Inside the Plant 2 Heat Treat shop where Madison is working, the temperature is already a sweltering 108 degrees.

"When we get a bad combination of high heat and high humidity like this, it can get pretty unbearable in here," says Madison. "We keep the doors open and the fans going, but there's really no escaping the heat. It's just part of the job."

Heat discomfort is a common problem in many of the shop areas throughout the company. When summer temperatures begin to soar, so too does the problem of keeping cool on the job.

"Each of our manufacturing facilities has its 'hot spots,' where air conditioning is, for one reason or another, impractical," says Jim Spencer, director of Industrial Safety & Hygiene. "Grumman doesn't have any standard hot weather procedure. But we do encourage people to use common sense in the summer months. Wear loose fitting clothes of a breathable fabric like cotton. Drink plenty of fluids and pace yourself. Pushing too hard in the heat is not only unproductive, it's dangerous."

Many of the people who work in the various hot spots say they eventually become acclimated to the higher temperatures. But the combination of high temperature and high humidity is something everyone agrees there is just no getting used to.

In the Plant 2 Heat Treat area, Madison and his co-workers must work close to special ovens that generate temperatures of up to 1,900 degrees. "With these ovens running all day it can get pretty hot in here. The heat and humidity can drain you too and that's when an accident could happen," says Madison. "That's why whenever it gets too bad we take a break – maybe visit an air conditioned office for a few minutes or just get a drink of cold water."

People in the Drop Hammer shop located in a large open quonset hut behind Plant 2 spend a good deal of the summer months "just praying for a little breeze," says foreman John Grodeski.

When the humidity is high and there's no breeze the Drop Hammer shop can turn into a giant hot house. The area includes a 1,000 degree salt bath tub for metal curing and an enormous cauldron that contains molten lead for die casting.

Grodeski notes that there have been several improvements over the last few years, including an air exchange system that keeps fresh air circulating in the hottest areas. "Our exhaust fans and air exchange vents help somewhat, but when the air outside is just as hot as in here . . . well, then you just sweat," says Grodeski.

For people in Grumman's Emergency Products production facility in Roanoke, Virginia, the summer isn't all mint julips and cherry blossoms. Plant manager Lib Riddell says the combination of heat and humidity in the southern plant can get "downright unbearable" at times.

To create a breeze, 18-foot tall doors at either end of the cylindrical shaped plant are left open and large fans push fresh air into the shop areas.

"It can still get very uncomfortable in areas like welding or the paint shop, where we can't have a fan blowing directly on a person because of the work itself," says Riddell. "We tell everyone to take frequent trips to the water fountains and rest whenever they get too hot."

Dr. Vincent Gallagher, Grumman's Medical director, says that fluid loss is one of the most serious concerns during the summer months. "When people sweat a great deal, they lose important minerals that their bodies need to function properly. In addition, they can become dehydrated by the loss of fluids. That is why we recommend an increase in the amount of liquids a person takes in during the summer – even beyond satisfying thirst. Thirst is not a truly accurate indicator of our body's need for fluids."

'Thirst is not a truly accurate indicator of our body's need for fluids.'

In the past, Grummanites were often given salt tablets in the summer. The salt tablets were thought to retain water and replace sodium lost through perspiration. "Grumman no longer distributes salt tablets because modern medical science has proven they are not beneficial," says Dr. Gallagher.

The mineral that the human body loses most through perspiration is potassium. "Which is why we now recommend that people drink plenty of fruit juices, and eat more fruits and salads during the summer – food and drink that are high in potassium," he notes.

In addition to drinking more fluids and eating more salads, Dr. Gallagher says Grummanites should try to follow the example of the British, who gained a good deal of experience dressing in warmer climates during their colonial Empire days.

"Unfortunately, people working in the shop environment can't run around in Bermuda shorts since many jobs require some skin protection. They can try to dress properly for the heat – loose fitting, light materials, like cotton, that can breath," he says.

Though you might get an argument from Grumman people in Houston, Maryland or even New York, Operations in Milledgeville, Georgia may well take the top spot for unbearable humidity. The plant has already been forced to close its paint shop once this summer, when the combination of 104 degree temperatures and almost 100 percent humidity proved too much. And that was at 7 o'clock in the evening.

"Sometimes the air is so heavy it feels like steam and we get a thunderstorm almost every afternoon during the summer," says Everson Weekly, Milledgeville's safety representative.

Weekly works closely with the medical department to organize heat stress classes at the beginning of the hot weather season, which starts sometimes before March.

The problem is especially difficult to deal with in work environments where protective clothing is required. "In our paint shop, people have to wear respirators and protective paint suits. These suits don't let anything in to harm the skin but that also means that they don't let any heat or perspiration out," Weekly points out.

This summer Milledgeville is studying the use of a special "cool vest" that could be worn under protective clothes. The cool vest is filled with water or some other fluid, and kept in a freezer prior to being worn. It is designed to take heat away from the body and circulate cool air into the clothes.

"The kind of cool vests that are on the market today are very bulky and cumbersome to work in and even the best model only lasts for about four hours," explains Weekly.

A new vest on the market may offer better per-

Heat treat operator Mike Lisa works with special 1,800 degree ovens in the Bethpage Steel Heat Treat center.

‹e It Tough

formance. "The one we're looking at now is made up of a mass of spaghetti-like tubes that are filled with cool water. It cools the body while still affording reasonable mobility," says Weekly.

One method of personal cooling that is already in use in several paint shops throughout the company is the 3M whitecap helmet. The whitecap is a standard industrial hard hat with an attached shroud. The shroud is tucked into the workers protective coveralls and a special vortex tube is connected to pump compressed air into the clothes. The fresh air is drawn from within the plant and filtered before it is pumped through the vortex tubes.

An idea similar to the 3M whitecap and its vortex tube is being used in Grumman's Glen Arm, Maryland machine operations facility. But this system can cool off more than one person at a time: it pumps fresh air into an entire two-story shop area.

The air exchange system consists of a series of filters, fans and vents in the walls and ceiling of the plant. Fresh air is drawn in from outside while stale warm air from inside is removed.

"Before we had the air recirculation system we suffered through some real bad summers," says plant safety representative John Kennedy.

Kennedy stresses the need to be aware of what the heat does to people's nerves. Hot, sweaty working conditions can make people extremely irritable. That means everyone should try to be extra considerate to each other. "You've got to stay cool physically as well as emotionally," he says.

Staying cool is surprisingly somewhat easier in Stuart, Florida, where Aircraft Systems people enjoy the benefit of an ocean breeze -- most of the time.

"The majority of our shop work is done in large hangars. With the doors open, we usually get a nice ocean breeze," says Bill Macdonald, Stuart safety representative. "Of course, you have to be especially careful when you're outside because that Florida sun can be a killer."

The hot Florida sun is also the nemesis of Grummanites working in St. Augustine. Lacking the advantage of an ocean breeze, St. Augustine must take added precautions against heat stress.

Safety representative Mahlon McNiel says some steps have recently been taken to prevent dehydration. "We've had fruit juices and Gatorade added to the choices in all our soft drink vending machines. I've been trying to get the word out that for replacing minerals lost through excess perspiration, soda is not as good as fruit juices or even plain water.

'With the doors open, we usually get a nice ocean breeze.'

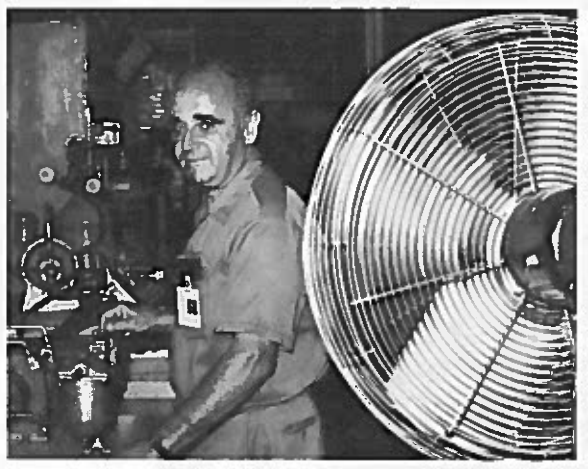
Juice carts make frequent tours through the St. Augustine shop areas distributing orange and grapefruit juice to thirsty Grummanites. "If people eat right, take plenty of fluids, and pace themselves, there should be little danger of heat stress on the job," says McNiel. "Just the same, we give everyone a briefing on how to recognize heat exhaustion. And we ask people to keep an eye on one another for signs of fatigue related to the temperature."

Grummanites who are new to St. Augustine are screened for any special health problems and usually get placed in a job where they can get used to the Florida sun gradually. "Most of our people have been living in the area for a long time and as such are already acclimated. They know how to pace themselves," says McNiel. "Where we run into a problem is with someone who is not used to the year-round heat and intense sun. Those people we keep a special eye on in the summer."

Though special cooling apparatus like the cool vest, the 3M whitecap, and giant air exchange units do improve conditions in some especially hot work areas, most plant safety representatives say they rely primarily on people using their common sense.

Dr. Gallagher's advice is simple. "If it is too hot for you to be productive, then stop," he says. "If you feel overheated, take a break, get a drink, find some shade or air conditioning and *cool off*."■

otective gear, like his reflective jacket, padded gloves and face shield, help keep the heat off Drop Hammer operator Joe Contento (above) he works over a 700 degree vat of molten lead in Bethpage. Cool, fresh air is pumped into the whitecap helmets and coveralls worn by 'ople working at Calverton's paint shops (L).



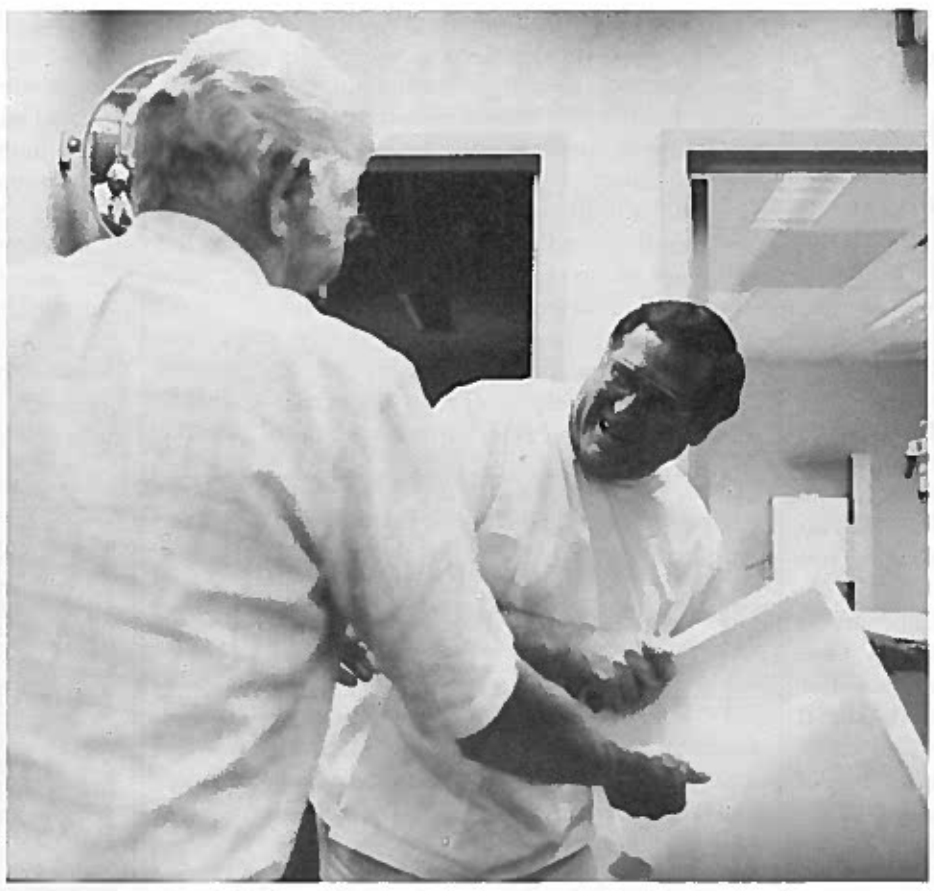
Fred Matthews, a ground support technician in Stuart, Florida, keeps cool wearing comfortable, loose-fitting clothes. The fan helps too.

Hot Tips For Staying Cool

As the mercury in the thermometer rises, so does the chance of people suffering from heat stress on the job. When working during the summer months, you have to take special care to stay cool.

There are many ways to prevent heat stress:

- Allow your body to adjust to the warm weather naturally by gradually increasing the time you spend in the heat. Most people can get accustomed (acclimatized) to warmer temperatures in about four to seven days.
- If you live, work, and drive in an air conditioned environment, you probably aren't acclimatized.
- Acclimatization is lost when you've been away from a hot environment for a week or more.
- Drink plenty of water. During hot weather, the body loses up to three gallons of fluid a day. People should drink water every 15 to 20 minutes, even when they are not thirsty. Thirst is not a reliable guide to the body's need for water in extreme heat.
- Eat lightly. Cold fruits and salads are easier to digest in hot weather than gravies, sauces and fatty foods.
- Rest often. Give your body a chance to cool off. Rest in the shade or in an air conditioned or well-ventilated room. Short, frequent breaks are more effective than long, infrequent ones.
- Avoid alcohol. Drinks that contain alcohol cause dehydration, an added burden for your body in hot environments.
- Plan ahead. Do the most strenuous part of your job during the cooler periods of the day. Pace yourself and plan work schedule to minimize activity in the hottest areas.
- Proper clothing can reduce the dangers of working in the heat.
- Neglecting protective equipment because of hot weather is an unacceptable tradeoff of safety for comfort.
- Outdoors, avoid direct exposure to the sun by wearing wide-brimmed hats, sunglasses, sweatbands.
- Loosely woven cotton clothing will allow air to circulate better and sweat to evaporate faster than synthetic materials such as nylon and polyesters.



A day in the lives of some Grumman retiree records analysts (Clockwise from bottom left): Mary Kranz double checks contents of file box headed for storage. Harvey Murtaugh (L) and Johnnie Garvey apply finishing touches to a box of dated files earmarked for destruction. Retiree Joe Murray (L) must use a little more than subtle persuasion to make a point with Medical Dept. senior technician Tex Jackson. Paul Tressa decides a file's fate.

Retirees Help Grumman Get A Grip On Paperwork

"Once you convince people that you're not stealing from them, this job really is a lot of fun," says Grumman retiree Mary Kranz, as she double checks the box she's labeling. "Here's another batch for storage."

She slides the box to the end of her battered metal desk. The box will soon be moved by her co-workers to the pile of other storage boxes in their makeshift headquarters in the Plant 9 basement in Melville (N.Y.). "It's not the Ritz, but that's O.K. We'll be moving on to a new job soon."

Kranz and eight other Grumman retirees are Records Management's 1985 team of records analysts. They have just played the major role in an analysis and purge of records for the Aerostructures Division. In three months time, they have removed 29 tons of records in about 1,400 boxes.

"You have to remember that people are a little funny about their files. If you don't approach them in the right way, they think you're criticizing them personally," says Kranz. "But, we've all been in their shoes, so we understand the way a lot of them feel." She had worked in Plant 40 Communications before her retirement in 1978. Less than a year later, she returned as a Grumman part-timer in the Records Management program.

"This type of job is the perfect middle ground. We only work part time as we're needed, so it's a far cry from holding down a full time job," she says.

"A lot of us worked in Communications and in the mailrooms while we were at Grumman. You meet a lot of people that way. And you learn a lot about human nature, which helps out in this job."

Johnny Garvey retired from his job in Configuration Data Management two years ago. "I moved down to Arizona, but I just couldn't get used to it. It was nice, but very isolated, " says Garvey. "I guess we all need a little action."

"Before I retired, if anyone had told me I'd come back to work, I'd have thought they were crazy. But you'd be surprised how fast those retirement dreams run thin," says Helen Aragonesi, who retired from her Plant 15 Communications post five years ago. "Even relaxing in the yard and sleeping late every day can get tiresome. You've got to keep going."

The Records Management Department through its GRIP (Grumman Records Improvement Program) is charged with the task of assisting in reviewing a department's files, deciding what is relevant to its operation and removing what is judged to be inactive. GRIP has saved Grumman departments over two million dollars in its 10 year existence, removing about of 200 tons of inactive and outdated files annually.

For the last seven years of the program, Grumman retirees have been hired to do the bulk of the files purging.

"We've had great success with our GRIP retirees," says Jack Scully, deputy director, Administrative Operations. "A files purge is not something people take to very easily – even when they get the word from on high. They take their files very personally. Almost inevitably, the retirees run into friends or former coworkers. That gets them over the biggest initial hurdle – trust."

"We're like salesmen," says Garvey. "We have to make that first hit in a department and then the rest just falls into line. Once people see that we didn't do anything terrible to a co-worker's files, they're a lot more accommodating. It's just getting your foot in the door.

"It's amazing to see the transformation in people. In no time at all, they're pulling apart the files faster than you can," he adds.

"A lot of times, I think we just wear down some of our problem people," says Aragonesi. "We smile a lot, and explain that we're just doing our jobs and that sooner or later, they're going to have to deal with their files."

She explains that breaking the ice often includes asking about family pictures or any other interesting articles people have on their desks.

"If there's a particularly unwilling individual in a department and we can win him over, the rest usually fall in line," says Ben Czizik, the first retiree to come to work on GRIP seven years ago. "Most of the time though, people are too busy or afraid to take on the job."

A walk with Czizik through the division's offices nets numerous smiles from passersby, many of whom greet him by name.

"We have nothing but admiration for the job these retirees have done," says Joe Sikora, assistant to the president of the Aerostructures Division. "This was the first time we've had our records surveyed in the five years we've been at this location. We've recovered 600 square feet of office space that used to contain files."

"They really know how to handle people," says Maryann Lagonigro, program administrator for the Aerostructures Division. "And they do the job in such an undisruptive way."

The retirees find most of their "clients" to be cooperative, too.

"We usually have to do a little prodding to convince people that they really don't need all of their files," says Ed Reardon, who retired six years ago after 23 years at Grumman. "But most of the times, they're reasonable. Of course, you know you've got the upper hand when you pull out a World War II vintage folder." And with a twinkle in his eye, his voice little more than a whisper, he adds, "You'd be surprised how often that happens." ■

Space Recovery

Does it ever take you longer than a minute or two to locate a file? No matter which way you turn in your office, do you find yourself face to face with a file cabinet?

It could be that you're holding on to more files than you need. Records Management might be able to help.

Based in Grumman Headquarters in Bethpage, Records Management assists departments in determining what files or records are **really** necessary for their daily operations. In the process, it can suggest ways to better handle the flow of a department's paperwork. A basic rule of thumb of records management is that one third of a department's records are usually active, one third can be removed to inactive storage and one third can be destroyed.

"One of our objectives is to recover floor space, which is now running about $11 to $15 a square foot in the open market," says Bob Sanginario, manager, Records and Systems Management. "We also try to set up a records keeping system that is self servicing, so similar house cleaning sessions in the future can be avoided."

If you want to find out more, call Bob Sanginario, Ext. (111) 57494. ■

Rolls-Royce Gets Eight Months of GDS Computer Smarts

A Grumman Data Systems team recently returned to the States after eight months of living and working in Bristol, England. The four-member team had been helping Rolls-Royce Ltd. develop a requirements document for a new computerized test system for engines.

"It's been quite a learning experience for all of us," said Hans Kampmann, program director. "Hopefully, we'll be back later this year."

'We're not normally in the consulting business.'

Under a $300,000 system engineering and technical assistance contract, Grumman Data Systems has been helping Rolls-Royce define its needs for a new engine development test system before the company goes out for actual bids.

"We're not normally in the consulting business," said Charlie Schiano, director of Advanced Projects. "Grumman would only take on this job, if it was still permitted to bid on the eventual production contract. Our goal is to eventually supply Rolls-Royce with a GDS system."

Rolls-Royce Ltd. designs and manufactures gas turbine engines for a wide range of aircraft, marine and military equipment. Its jet engines provide the power for aircraft of more than 300 airlines, 114 armed forces and 660 corporate operators. In addition, 23 of the world's navies are equipped with warships powered by the company's gas turbines.

To remain a frontrunner in the highly competitive engine industry, Rolls-Royce Ltd. is investing over 250 million pounds ($350 million) to streamline its operations. One such area targeted for improvements is engine development testing.

In 1984, Rolls-Royce called on Grumman for assistance in gathering the information on how to go about honing its engine development test work.

For the past eight months, Grummanites (L to R) Al Fogg, Charlie Schiano, Paul Vesely, and Hans Kampmann of Data Systems Division have been living in Bristol, England. They have been helping Rolls-Royce Ltd. develop a requirements document for a new computerized test system for engines.

"GDS has rather extensive experience in the computer test systems area," said Schiano. "We had just completed an similar instrumentation system for the U.S. Air Force at Arnold Engineering Test Center in Tennessee. And, since the early Seventies, we've had own our test team at Calverton's Automated Telemetry Station (ATS)."

"The British were very interested in our ATS team. They don't operate a test team," added Paul Vesely, technical advisor. "Departments are largely working independent of each other until the final stages. There is a lot of multiple—and duplicate—testing here. Joining all the groups together via computers will really cut down on development costs and time."

Right now, it takes Rolls-Royce four to five years to develop a new engine. "Rolls-Royce would like to chop the development time down to two years," said Vesely, who normally works at ATS in Calverton. "In addition, it hopes to cut down on the number of engine components that must undergo individual testing."

At present, Rolls-Royce operates 30 test cells at its civilian engine center in Derby, its military engine facility in Bristol, and at 13 other sites throughout England. A test cell is where an engine is hooked up to instrumentation and tests are run to verify the design. Test cells are used for just one or two engine components or for an entire prototype powerplant.

"They have to automate their testing capability, not only during the build-up stages but throughout the entire engine test cycle," said Vesely.

All four Grummanites travelled throughout Britain gathering facts at the various test cell sites . The most interesting aspect of the overseas assignment was living and working with the British, said the Grummanites.

"We acted not only as technical advisors, but we also offered recommendations on how to reorganize their testing groups . . . right from the top on down," said Kampmann.

The Grummanites had the opportunity to talk to over 300 Rolls-Royce employees during an eight-week period. "We not only interviewed the people who would be using the new system," said Kampmann. "but also the middle and top managers to see how they perceived the system in the overall scheme of things."

"Normally, we don't have that luxury," said Vesely. A similar report in the States is traditionally a very technical paper. The Rolls-Royce job called for a different approach. The world-renowned engine company wanted a report that was geared directly to the users – not an intense technical description of the new system.

"Rolls-Royce didn't want a bunch of 'computer freaks' coming in and suggesting a computer system that would not suit their needs," continued

'The British were very interested in our ATS team.'

Vesely. "We were able to get valuable information by talking to everyone and finding out their needs and then beefing up areas of the system as we saw fit.

"Many times, you are locked up in a technical hole writing the very technical specifications to meet the customer's already defined requirements," he added. Rolls-Royce didn't necessarily know how to go about restructuring their engine development testing and where and how the new system would fit in.

No doors were closed to the GDS

(Continued on next page)

A Smashing Stay In the U.K.

BBC doesn't offer MTV. The ale is a tad warmer than American beer. Driving on the left takes time to grow accustomed to. Still, living and working in England was an opportunity Al Fogg, Hans Kampmann, Charlie Schiano, and Paul Vesely couldn't pass up.

Because the Rolls-Royce assignment was short term, all four Grummanites did not bring their families over to Britain for the duration, though the families and friends did cross the Atlantic for visits. In fact, Kampmann had so many visitors from the States that the group believes he could easily slip into a Beefeater uniform and conduct guided tours of the Tower of London.

Separation from family was less of a burden on the Grummanites than it was for their families back in the States. "We were still in the work environment and in our off hours had time to travel and go see the sights," said Kampmann. "Meanwhile, we didn't have to face the everyday responsibilities at home. We didn't have to worry about cutting the grass, paying the LILCO bills, and all that."

Vesely looked forward to returning to Long Island so he could start doing just that. He had bought a house one month before he left for England and was anxious to take on the woes of home ownership. Still, the Rolls-Royce assignment was a excellent opportunity to explore Europe and England, he said.

"Everyone in Europe travels during holiday breaks," said Vesely. Both he and Schiano found out the hard way. They tried booking a flight to Paris much too close to the spring break. "Every flight to the Continent was booked. We ended up driving to Paris. After some searching, we also managed to find a hotel room. Everybody was on 'holiday' that weekend."

Vesely did have one big disappointment during his stay in England – he missed the Boss' European tour. "It was great when I found out Bruce Springsteen would be in Europe the same time I would be, but all the concerts were sold out."

Flexibility is the key to enjoying an overseas assignment. "You get the most out of your stay if you live just like the Brits," said Kampmann. "You find the local pubs, restaurants, and markets that everyone uses. And, you try to stay away from the tourist traps."

You also don't ask for a bag of ice at the local store. "When I did, they laughed at me," says Schiano. Ice cubes are scarce in Britain. If you ask for ice in your drink, you get one or two little cubes.

Schiano's wife and children got a big kick out of their brief stay in his "flat." "If it had worked out with the school year, they would have liked to have lived over here," he said.

His kids loved the cream on top of the milk bottles that are still delivered to doorsteps. In no time, they made friends with the kids on the block and played soccer ("football") in the schoolyard across the street.

Though it was a productive and exciting experience to live in a foreign country, there were yearnings for home. Said Kampmann, "I found myself looking for American television shows and watching them even though I never watched them in the States."■

L. W. Wicklund Jr.

F. E. Leach Jr.

G. E. Frenzel

K. F. Rash

J. Kormendi

L. L. Trifaro Sr.

F. A. Heppler

C. M. Ille

T. E. Luzzi Jr.

D. Antonucci

B. A. Sidor Jr.

T. H. Lindblad Jr.

W. J. Holmer

G. Fuchs Jr.

R. B. Walker

J. Giannetta

R. D. Guido

Service Milestones

40

Lawrence G. Olsen, Pwr. Plt. Des. (1)
Joseph G. David, Pride Line (2)
William H. Bruning, Ops. Anal. (5)
Theresa M. Donlon, Mach./Parts/Mat'l. (30)

35

Gerard G. Brinker, Sub. Assy (1)
Richard W. Gehrt, M&ME Mgmt. (1)
Paul E. Shadlich Jr., Repair Cont. (3)
Arthur E. Graham, I.E. Flow Seq. Plan. (5)
Thomas A. Taglarine, Struct. Sci. Proj. Mgt. (5)
Edward G. Markow, Adv. Aircraft (5)
Joseph B. Gogarty, Qual. Proc. Mat'l. Mgt. (30)
Robert S. Glowacki, Std. (35)
Elmer M. Bauer, Dyn. (40)
Michael Pelehach, President, Grumman International (GHQ)

30

Richard A. Burrell, ILS Supply Ops. Proj. Mgt. (1)
Leonard J. Ober, Mech. Process. Engr. (2)
Fred F. Durham, Maint. (2)
John H. King, Mfg. Prod. Cont. & Prog. Mgt. (2)
Robert J. Walsh, Parts Paint (3)
Joseph Casey Jr., ILS Supply Ops. Mgt. (4)
Thomas Tatarian, Plann. Mgt. (5)
Casper Catalanotto, Aero. Test (5)
John J. Gilbert Jr., Corp. Instr. Gd. Test (5)
John J. Giunta, Proj. Eng. Veh. (6)
Alfons R. Kroll, Govt. Mat'l. Cont. (7)
Lawrence B. Brown Sr., Flt. Dev. Ops. (7)
Savino C. Albanese, Pwr. Plt. Des. (9)
Willy A. Wolter, Struct. Anal. Staff (9)
Richard W. Harris, Saw (17)
Anthony Favale, Research Mgt. (26)
Bernard F. Lang, Mat'l. Acct. (30)
Robert L. Erath, Res. Tech. Supt. Ops. (35)
Francis D. Barnes, Qual. Ops. Plann. (35)
Albert J. Gagliano, Corp. Qual. Mgmt. (35)
Frank Hejduk Jr., Elect. Cable Fab. (43)
Ronald A. Collins, Reqmts. Plann. (43)
Robert S. Rulon, ILS Train. Sys. Eng. (47)
Eugene Walkowiak, ILS Train. Sys. Eng. (110)
Paul R. Schatzel, Pers. Relations (GHQ)
Bartholemew V. Glowacki Jr., Source Insp./Test (204)
Arnold P. Schaffer, P.D.C. Mgt. (274)

25

Lawrence W. Wicklund Jr., ILS (1)
Frank E. Leach Jr., Prod. Supervision (2)
George E. Frenzel, Sys. Test/Flt. Integ. (4)
Katherine F. Rash, Admin. & Res. Control (5)
Jeno Kormendi, Sys. Dev. & Integ. Mgmt. (5)
Leonard L. Trifaro Sr., Struct. Subs. (6)
Silas Ruga, GDS-ATS Ops. (6)
Frederick A. Heppler, Rec./Shipping Insp. (6)
Carole M. Ille, Cost Supply Reqts. Mgt. (30)
Theodore E. Luzzi Jr., Fluid Dyn. (35)
Dario Antonucci, ILS Ops. Supt. (39)
Bruno A. Sidor Jr., A-6 Prog. Mgmt.(40)
Joseph A. Cerruto, Prog. Mgmt. (43)
Theodore H. Lindblad Jr., ILS Prog. Mgmt. (106)
Wilbert J. Holmer, ILS (106)
George Fuchs Jr., ILS (110)
Robert B. Walker, Navig. & Cont. Equip. Des. (110)
Jo Giannetta, GDS Bus. Cont. (GHQ)
Robert D. Guido, Maint. (GHQ)
Mario G Boltri, Grumm. International (GHQ)

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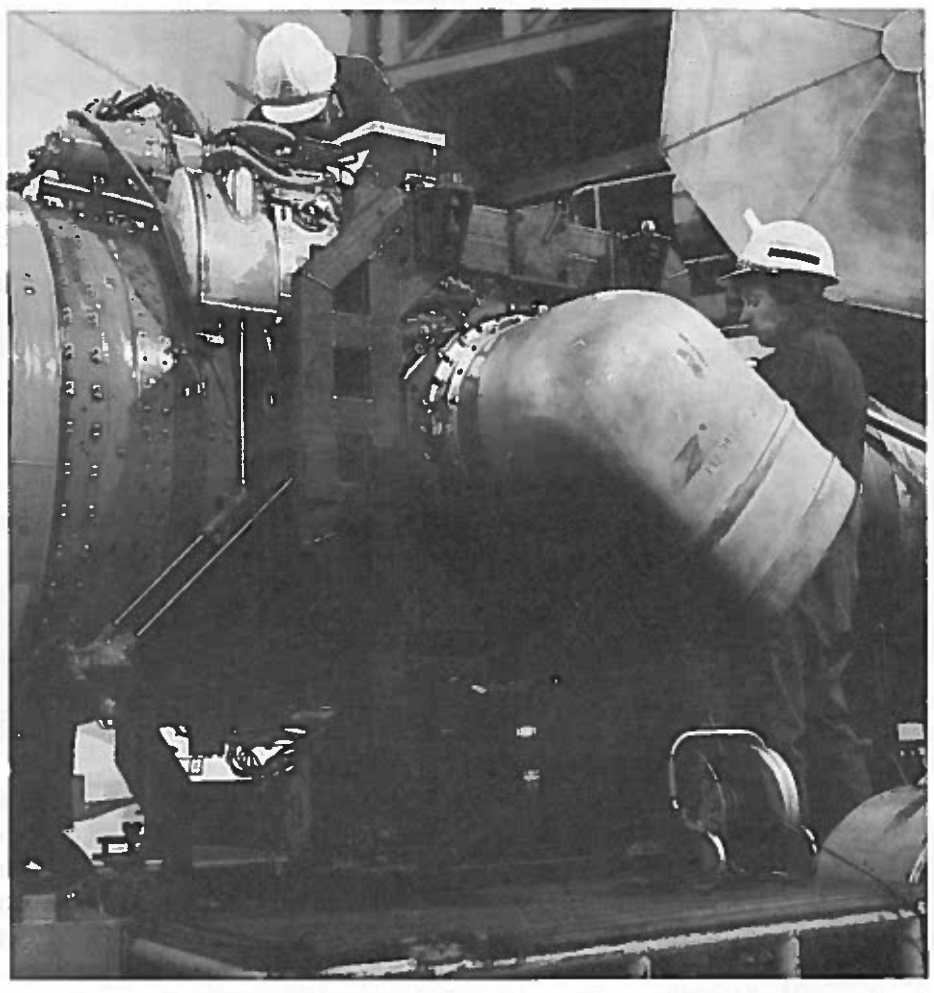
Rolls-Royce And Grumman

(Continued from previous page)
team. "It was an ideal situation. We had the opportunity to see from the inside out how the British company does business," said Kampmann.

"One thing was perfectly clear, the Rolls-Royce people are committed to the future," added Schiano. With an investment of over 250 million pounds, Rolls-Royce also plans to add a computer-aided design and manufacturing system, automate many of its manufacturing activities and purchase a high-speed, scientific super computer.

Before leaving for home, the GDS team submitted its report to Rolls-Royce management for the initial phase of the new engine development testing system. Included were the new system's requirements, selected equipment, organizational recommendations, cost and benefits, and suggestions on how to approach the reorganizational phase.

Later this year, they hope to return to Rolls-Royce and help in the Phase B portion — preparing a request-for-proposal (RFP). The RFP will be issued approximately nine months from now. The eventual contract award is anticipated in late 1986. ■


Roll-Royce technicians are working on an engine part before it undergoes development testing in one of the company's 30 test cells throughout Britain.

For A Good Cause

Grummanites are the stars of a new videotape, opening soon at a plant near you.

The 15-minute tape is a documentary on Grumman's Blood Program. It was produced by Grumman's Public Affairs — Television/Audio Visual people. It includes commentary on the importance of donating blood regularly and interviews with Grummanites who have benefited medically from blood services. There are also quite a few interviews with Grumman donors from Bethpage, Great River, and Calverton.

According to Paul Colon, director of the Blood Program for 1985, the tape is being distributed to all Long Island plants that have scheduled blood drives in '85. He has asked plant managers to screen the film one week prior to a drive.

Colon hopes the tape will convince additional people to join the ranks of their co-workers who are regular donors. The Blood Program hopes to achieve a milestone this year: 10,000 pints by year's end. ■

Milledgeville Picks Scholarship Winner

Paul Hargaden is the 1985 recipient of Milledgeville (Ga.) Operations' annual Science and Engineering Scholarship.

Milledgeville Operations awards the scholarship each year to a graduating high school senior from Baldwin County. The scholarship provides $1,000 annually for four years of study, and a summer job at Milledgeville.

Hargaden will attend Georgia Institute of Technology this fall. He plans to study electrical engineering.

Laurie Ann Gilmore, who also plans to study electrical engineering at Georgia Tech, is the alternate. As such, she will also receive summer employment.

Hargaden and Gilmore were chosen for their interest in their major, science projects and activities related to that field, its relevance to Grumman's business, extracurricular activities, SAT scores, and personal qualities. ■

The Third World And Our Future

By Ozzie Williams

O.S. "Ozzie" Williams is Vice President-Africa of Grumman International. He joined Grumman in 1961.

A specialist in technology transfer to the Third World, Williams has visited 17 countries. He was recently selected to serve in the American Participant Program of the United States Information Agency (U.S.I.A.).

A Thai worker gauges drilling wellheads as part of a pressure test program at a site on the South China Sea. African farmers are still employing centuries-old methods in harvesting cane. AP Worldwide Photos

A farmer in the African country of Senegal watches helplessly day by day as the Sahara desert encroaches upon the grassland area of the Sahel region that he calls home.

Unable to invest in the type of motorized pump that will transport water from 200 feet underground to irrigate his fields, he and his countrymen are watching their centuries-old way of life come to an end. So, too, are the people in the other countries of the African Sahel, which stretches across the continent from ocean to ocean, south of the Sahara.

His desperation is the sign of drastic differences of living among the peoples of the world. It is a warning that all of us must heed, because it could spell disaster for our way of life as well.

Senegal is one of the poorest of the world's developing or "Third World" nations. The Third World accounts for about three-quarters of the global population today. Those countries constitute virtually all of Asia, Africa, South America and most of North America south of the United States.

With such an overwhelming proportion of the world's population, land mass and natural resources, it stands to reason that the Third World should be a major producer of goods as well as the major marketplace for the world's manufactured products.

In reality this is far from the case. And the massive task of developing these markets and erasing this lopsided global relationship will bring unparalleled world prosperity; failure to do this will spell complete financial ruin.

The task of dealing with the Third World as equals is unique to the post-World War II era. Most of these countries are former colonies. They provided raw materials and a ready-made marketplace for the goods of the colonizing nations. By and large, though, their daily existence remained the same as it had been through the centuries.

The end of World War II began the final demise of the old colonial system. And the Third World nations were precipitated into a world economic system they had never known before. Unfortunately, the colonial mentality of the industrialized world persisted.

The industrialized countries fostered a "grow up and be like us" attitude, and sold technological equipment sometimes inappropriate to the needs and capabilities of Third World buyers. The recipients, too, mistakenly seemed to assume that technology, any kind of technology, would quickly cure all of their economic ills.

The problems of most developing nations were compounded by the low income earned by their agricultural and mineral exports in world markets. Decades of poor planning and buying beyond their means have left many of these countries heavily in debt. Today, as the Third World's total debt nears the trillion dollar mark, most of its countries are still mired in the global recession of the early 1980's, while the industrialized nations have entered the recovery phase.

Only recently have the industrialized countries begun to realize the broader implications of the Third World's problems, and appreciate the interdependent nature of all national economies. Third World nations with healthy and productive economies are indeed our best customers. In the long run, we need them as much as they need us. "Trade, not aid" is becoming a new slogan of enlightenment. Dollars spent to help a developing country become self sufficient can reduce expenditures on emergency aid programs. And technology, carefully selected, will continue to be a key factor in promoting self sufficiency.

The beginnings of a true working relationship between both groups lies in a shared set of economic priorities. It's a two-way street. Emerging nations need to industrialize at a comfortable pace, appropriate to their unique needs and problems. The sellers of technology are entitled to a reasonable profit, with the prospect of greater market potential and increased profits down the line.

"Technology transfer" refers to the imparting of industrial and technical know-how from the "haves" to the "have-nots." To be effective, technology transfer should address long-term goals. It should consider the individual characteristics of a country, its markets, its facilities, government policies and all of its resources. Most importantly, it should consider the need for the developing country to plan its own growth at its own rate.

For their part, the Third World countries are advancing their own ground rules for buying technology; the industrialized nations and multinational companies must understand, and work within, these new constraints.

One of these new constraints is referred to as indigenization. This is a requirement that foreign investors share their business enterprises with individuals from the host country. Details vary from country to country, but they generally call for some specified percentage of the firm's ownership, and of its management jobs, to be held by local citizens.

Local content is another increasingly-used requirement, applied to products assembled from kits exported to a Third World country. It mandates that a specified fraction of the final product be manufactured locally, preferably from local materials. For example, for Nigeria's fire truck assembly plants, the target is for 30 percent of the trucks to be manufactured locally within three years after startup, 60 percent within six years and 100 percent in 10 years.

These are two methods by which Third World nations demand a piece of the action in technology transfer. More and more poor countries, caught in a cash squeeze, are also turning to counter trade, a cashless method of paying for imported goods and services.

The most common form of counter trade is a revival of the ancient barter system, in which payment is made in agricultural or mineral commodities in lieu of money. Examples of this abound: multinational firms have helped the West African nation of Ghana sell manganese, timber and bauxite to offset the cost of aircraft purchases. Uruguay, in South America, has traded sheepskins for automobiles. Mexico has exchanged oil for grain.

These arrangements were mutually agreed upon, but Indonesia was the first Third World nation to impose mandated counter trade. In business deals of $500,000 or more, that government requires that the seller to Indonesia buy an equivalent amount of Indonesian products.

Buy backs are another form of counter trade, in which the foreign builder of a factory in a developing country receives part of the payment in goods produced by the factory after it begins operation.

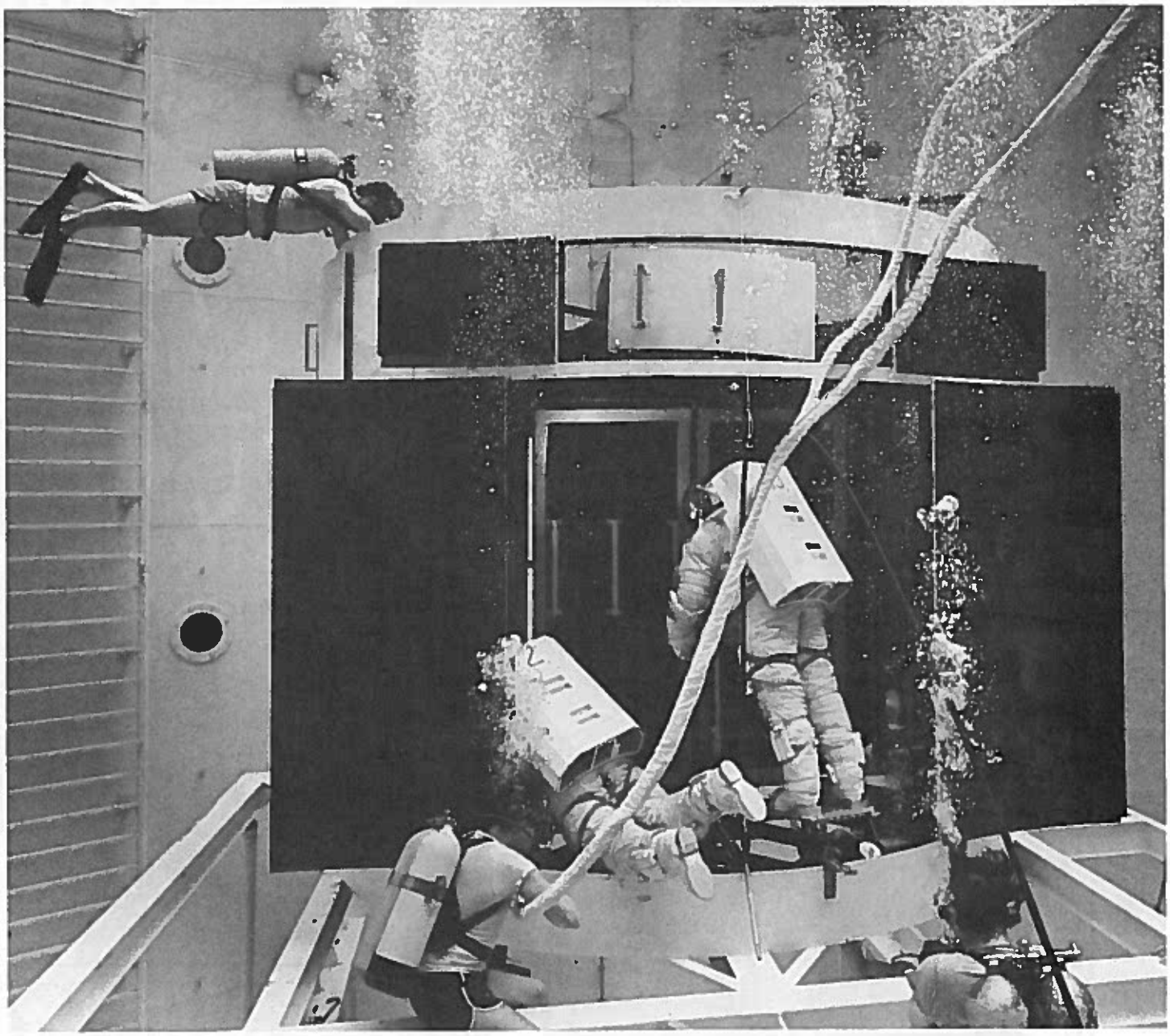
In order to ease the plight of the Third World and improve its viability as a marketplace, the industrialized nations must exhibit more flexibility in trading patterns, and develop long-range thinking.

The new constraints and ground rules show the determination of less-developed countries to become more self-sufficient, and counter trade is one practical way of tackling their debt problems. Help and understanding from the industrial world can be the decisive factors if true global prosperity is ever to become a reality.

There was a saying that arose following World War II - "One World or None." Today, it's clearer than ever that economic interdependence among nations is a fact. If the Third World succeeds in its development efforts, the lives of its billions of citizens will be bettered, and it will contribute to the most economically prosperous world ever. If it fails, it is possible that no nation on earth would escape the strain it would produce on the world's economy. ■

GrummanWorld

July 26, 1985



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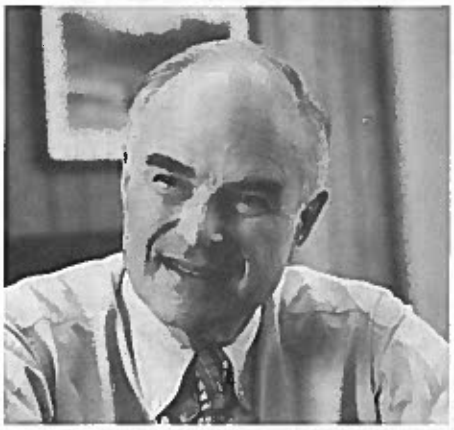
A Letter From The Chairman



It's nearly impossible to read the papers or turn on the news without learning of yet another scandal in the business world. One company after another is accused of some abuse of the public trust; their managers indicted for lying under oath, obstructing justice, improper disclosure, price gouging.

Companies entrusted with the responsibility of building products for our nation's defense are under fire: the public wonders if that trust is misplaced. A recent Business Week/Harris poll showed that an overwhelming majority of Americans believe that defense contractors are ripping off the government.

That perception is of great concern to us.

The expense to those companies under fire — in the morale of their people, in public perception — cannot be calculated. As Grumman found out with the infamous ashtray, even the *appearance* of an inappropriate action can be most damaging.

I'm sure that most of the people in those companies are decent, honest people. They go to work every day and do their jobs. But the integrity of their effort is undermined by the actions of a few. It takes a long time and a lot of hard work to build a good reputation.

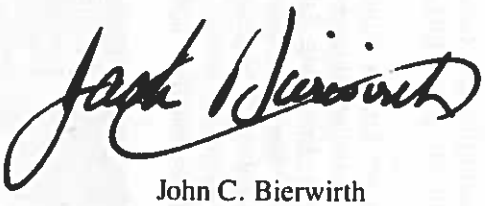
It takes no time at all to destroy it.

Grumman has always relied on the honor and integrity of people, in their common sense and good judgement. But in an increasingly complicated world, it's important for us to remember that we have help available in making proper business decisions. The Business Ethics Committee can help Grumman people who have questions or who wish to discuss matters relating to ethical conduct.

The chairman of the committee is Howard Dunn, vice president-Audit. You can contact the committee by writing to Mail Station A16-GHQ, or by calling Howard on Ext. (111) 53810. Call or write if you have a question about a decision confronting you — or if you have a question on what is being done in another part of the company. We should all have confidence that we are making the right decision in the right way.

Any company's reputation is of great importance to it. But a company that does business with the government has special cause for concern. Back in the earliest days of our nation, author and political theorist Thomas Paine wrote this:

"Public money ought to be touched with the most scrupulous conscientiousness of honor. It is not the produce of riches only, but of the hard earnings of labor and poverty. It is drawn even from the bitterness of want and misery. Not a beggar passes, or perishes in the streets, whose mite is not in that mass."



John C. Bierwirth
Chairman

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